

Ser. No. 10/789,425
Response dated August 17, 2010
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PRN06012

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Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims

1. (Currently Amended) A speaker system providing enhanced intelligibility of a reproduced audio program signal in the presence of ambient noise, the speaker system comprising:
 - means for receiving the reproduced audio program signal;
 - a microphone for monitoring at least ambient noise signals and for providing a microphone output signal;
 - means for enabling the microphone output signal during first increments of time when the reproduced audio program signal is substantially off, and disabling the microphone output signal during second increments of time when the reproduced audio program signal is on, such that the microphone output signal includes ambient noise signal components without including reproduced audio program signal components; and
 - a signal process, in communication with the means for receiving and the means for enabling/disabling, for applying a first transfer function to the reproduced audio program signal, the first transfer function incrementally increasing gain adjustments to the reproduced audio program signal as a function of an increasing average amplitude of the microphone output signal over a period of time during which said microphone output signal is enabled, and incrementally decreasing gain adjustments to the reproduced audio program signal as a function of a decreasing average amplitude of the microphone output signal over a period of time during which said microphone output signal is enabled.
2. (Original) The speaker system according to claim 1, wherein the incremental gain adjustments are in steps of between 1 dB and about 10 dB.
3. (Previously Presented) The speaker system according to claim 1, further comprising a first amplifier having an input and an output, the first amplifier input coupled to the output signal of the signal processor and the first amplifier output coupled to an input of a first speaker.

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4. (Original) The speaker system according to claim 3, wherein the first speaker comprises a single speaker driver having a diaphragm diameter not greater than about 100 centimeters (cm).

5. (Previously Presented) The speaker system according to claim 3, further comprising:

a low-pass filter having an input and an output, the filter input coupled to the output signal of the signal processor and the filter output augmenting the first speaker output in a low frequency region; and

a second amplifier having an input and output, the second amplifier input coupled to the filter output and the second amplifier output coupled to an input of a second speaker.

6. (Original) The speaker system according to claim 5, wherein the first and second speakers each comprise a single speaker driver having a diaphragm diameter not greater than about 100 centimeters (cm).

7. (Currently Amended) A speaker system providing enhanced intelligibility of a reproduced audio program signal in the presence of ambient noise, the speaker system comprising:

means for receiving the reproduced audio program signal;

a microphone for monitoring ambient noise signals and for providing a microphone output signal;

means for enabling the microphone output signal during first increments of time when the reproduced audio program signal is substantially off, and disabling the microphone output signal during second increments of time when the reproduced audio program signal is on, such that the microphone output signal includes ambient noise signal components without including reproduced program signal components; and

a signal processor, in communication with the means for receiving and the means for enabling/disabling for applying a transfer function to the reproduced audio program signal, the transfer function incrementally increasing high frequency response of the reproduced audio program signal as a function of a decreasing amplitude of the microphone output signal averaged over a period of time during which said microphone output signal is

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enabled, and vice versa, wherein the signal process output signal is maintained during such times as the microphone output signal is disabled.

8. (Previously Presented) The speaker system according to claim 7, further comprising a first amplifier having an input and an output, the first amplifier input coupled to the output signal of the signal processor and the first amplifier output coupled to an input of a first speaker.

9. (Original) The speaker system according to claim 8, wherein the first speaker comprises a single speaker driver having a diaphragm diameter not greater than about 100 centimeters (cm).

10. (Previously Presented) The speaker system according to claim 8, further comprising:

a low-pass filter having an input and an output, the filter input coupled to the output signal of the signal processor and the filter output augmenting the first speaker output in a low frequency region; and

a second amplifier having an input and output, the second amplifier input coupled to the filter output and the second amplifier output coupled to a second speaker.

11. (Original) The speaker system according to claim 10, wherein the first and second speakers each comprise a single speaker driver having a diaphragm diameter not greater than about 100 centimeters (cm).

12. (Currently Amended) A speaker system providing enhanced intelligibility of a reproduced audio program signal in the presence of ambient noise, the speaker system comprising:

means for receiving the reproduced audio program signal;

a microphone for monitoring ambient noise signals and for providing a microphone output signal;

means for enabling the microphone output signal during first increments of time when the reproduced audio program signal is substantially off, and disabling the

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microphone output signal during second increments of time when the reproduced audio program signal is on, such that the microphone output signal includes ambient noise signal components without including reproduced program signal components; and

a signal processor, in communication with the means for receiving and the means for enabling/disabling, including a first transfer function and a second transfer function having at least one signal processor output signal, wherein:

the first transfer function provides incrementally increasing gain adjustments to the reproduced audio program signal as a function of an increasing average amplitude of the microphone output signal over a period of time during which said microphone output signal is enabled, and vice versa;

the second transfer function provides incrementally increasing high frequency response of the reproduced audio program signal as a function of a decreasing average amplitude of the microphone output signal over a period of time during which said microphone output signal is enabled, and vice versa; and

the at least one signal processor output signal is maintained during such time as the microphone output signal is disabled.

13. (Original) The speaker system according to claim 12, wherein the incremental gain adjustments are in steps of between about 1 dB and about 10 dB.

14. (Previously Presented) The speaker system according to claim 12, further comprising a first amplifier having an input and an output, the first amplifier input coupled to the at least one output signal of the signal processor and the first amplifier output coupled to a first speaker.

15. (Original) The speaker system according to claim 14, wherein the first speaker comprises a single speaker driver having a diaphragm diameter not greater than about 100 centimeters (cm).

16. (Previously Presented) The speaker system according to claim 14, further comprising:

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a low-pass filter having an input and an output, the filter input coupled to the at least one output signal of the signal processor and the filter output augmenting the first speaker output in a low frequency region; and

a second amplifier having an input and output, the second amplifier input coupled to the filter output and the second amplifier output coupled to a second speaker input of a second speaker.

17. (Original) The speaker system according to claim 16, wherein the first and second speakers each comprise a single speaker driver having a diaphragm diameter not greater than about 100 centimeters (cm).

18. (Currently Amended) A method of enhanced intelligibility of a reproduced audio program signal in the presence of ambient noise in a speaker system comprising:

receiving the reproduced audio program signal;

monitoring ambient noise signals using a microphone to provide a microphone output signal;

enabling the microphone output signal during first increments of time when the reproduced audio program signal is substantially off, and disabling the microphone output signal during second increments of the time when the reproduced audio program signal is on, such that the microphone output signal includes ambient noise signal components without including reproduced program signal components; and

processing the reproduced audio program signal and the microphone output signal using a first transfer function, the first transfer function having a signal process output signal, the first transfer function providing incrementally increasing gain adjustments to the reproduced audio program signal as a function of an increasing average amplitude of the microphone output signal over a period of time during which said microphone output signal is enabled, and incrementally decreasing gain adjustments to the reproduced audio program signal as a function of a decreasing average amplitude of the microphone output signal over a period of time during which said microphone output signal is enabled.

19. (Original) The method according to claim 18, wherein the incremental gain adjustments are in steps of between about 1 dB and about 10 dB.

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20. (Previously Presented) The method according to claim 18, further comprising:
amplifying the signal process output signal using a first amplifier to produce a first amplified output signal; and
coupling the first amplified output signal to a first speaker input of a first speaker.
21. (Previously Presented) The method according to claim 20, further comprising:
filtering the signal process output signal using a low-pass filter to produce a filtered output signal;
amplifying the filtered output signal using a second amplifier to reproduce a second amplified output signal; and
coupling the second amplified output signal to an input of a second speaker.
22. (Currently Amended) A method of enhanced intelligibility of a reproduced audio program signal in the presence of ambient noise in a speaker system, the method comprising:
receiving the reproduced audio program signal;
monitoring ambient noise signals using a microphone to provide a microphone output signal;
enabling the microphone output signal during first increments of time when the reproduced audio program signal is substantially off, and disabling the microphone output signal during second increments of time when the reproduced audio program signal is on, such that the microphone output signal includes ambient noise signal without including reproduced program signal components; and
processing the reproduced audio program signal and the microphone output signal using a second transfer function, the second transfer function providing incrementally increasing high frequency response of the reproduced audio program signal as a function of a decreasing average amplitude of the microphone output signal over a period of time during which said microphone output signal is enabled, and vice versa, wherein the signal

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process output signal is maintained during such times as the microphone output signal is disabled.

23. (Previously Presented) The method according to claim 22, further comprising:
amplifying the signal process output signal using a first amplifier to produce a first amplified output signal; and
coupling the first amplified output signal to a first speaker input of a first speaker.
24. (Previously Presented) The method according to claim 23, further comprising:
filtering the signal process output signal using a low-pass filter to produce a filtered output signal;
amplifying the filtered output signal using a second amplifier to produce a second amplified output signal; and
coupling the second amplified output signal to an input of a second speaker.
25. (Currently Amended) A method of enhanced intelligibility of a reproduced audio program signal in the presence of ambient noise in a speaker system comprising:
receiving the reproduced audio program signal;
monitoring ambient noise signals using a microphone to provide a microphone output signal;
enabling the microphone output signal during first increments of time when the reproduced audio program signal is substantially off, and disabling the microphone output signal during second increments of time when the reproduced audio program signal is on, such that the microphone output signal includes ambient noise signal components without including reproduced program signal components; and
processing the reproduced audio program signal and the microphone output signal using a first transfer function and a second transfer function, the first and second transfer functions having at least one signal process output signal, wherein:
the first transfer function provides incrementally increasing gain adjustments to the reproduced audio program signal as a function of an increasing average amplitude of the

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microphone output signal over a period of time during which said microphone output signal is enabled, and vice versa;

the second transfer function provides incrementally increasing high frequency response of the reproduced audio program signal, and vice versa; and

the least one signal process output signal is maintained during such times as the microphone output signal is disabled.

26. (Original) The method according to claim 25, wherein the incremental gain adjustments are in steps of between about 1 dB and about 10 dB.

27. (Previously Presented) The method according to claim 25, further comprising:
amplifying the at least one signal; and
coupling the first amplified output signal to a first speaker input of a first speaker.

28. (Previously Presented) The method according to claim 27, further comprising:
filtering the at least one signal process output signal using a low-pass filter to produce a filtered output signal;
amplifying the filtered output signal using a second amplifier to produce a second amplified output signal; and
coupling the second amplified output signal to a second speaker input of a second speaker.